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L1	1	"6905854".pn.	USPAT	OR	OFF	2005/09/18 16:18
L2	1	"6699699".pn.	USPAT	OR	OFF	2005/09/18 17:00
L3	3	streptomyces near10 (penicillin near2 expandase)	USPAT	OR	OFF	2005/09/18 17:03
L4	14	streptomyces near10 (deacetoxycephalosporin near2 synthase or synthetase))	USPAT	OR	OFF	2005/09/18 17:02
L5	15	L3 or L4	USPAT	OR	OFF	2005/09/18 17:02
L6	12	I5 and (variant or mutant or mutated or mutation or mutating)	USPAT	OR	OFF	2005/09/18 17:03
L7	8173	(penicillin near2 expandase) or (deacetoxycephalosporin near2 synthase or synthetase)	USPAT	OR	OFF	2005/09/18 17:04
L8	245	I7 near8 (variant or mutant or mutated or mutation or mutating)	USPAT	OR	OFF	2005/09/18 17:05
L9	15	I3 or I4	USPAT	OR	OFF	2005/09/18 17:05
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synthetase))

L1 114 STREPTOMYCES (8A) (DEACETOXYCEPHALOSPORIN (2A)  
(SYNTHASE OR  
SYNTHETASE))

=> s streptomyces (8A) (penicillin (2A) expandase)

L2 9 STREPTOMYCES (8A) (PENICILLIN (2A) EXPANDASE)

=> s l1 or l2 (10A) (variant or mutant or mutated or mutation or  
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L3 114 L1 OR L2 (10A) (VARIANT OR MUTANT OR MUTATED OR  
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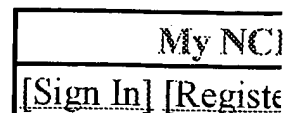
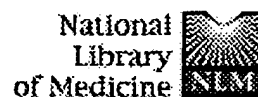
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(4A) (73 or 79 or 275 or 277 or 281 or 300))  
L5 0 L4 AND ((VARIANT OR MUTANT OR MUTATED OR MUTATION OR  
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Controlling the substrate selectivity of deacetoxycephalosporin/deacetylcephalosporin C synthase. J Biol Chem. 2004 Apr 9;279(15):15420-6. Epub 2004 Jan 20. PMID: 14734549 [PubMed - indexed for MEDLINE]

☐ 2: Chin HS, Goo KS, Sim TS.

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A complete library of amino acid alterations at N304 in Streptomyces clavuligerus deacetoxycephalosporin C synthase elucidates the basis for enhanced penicillin analogue conversion. Appl Environ Microbiol. 2004 Jan;70(1):607-9. PMID: 14711695 [PubMed - indexed for MEDLINE]

☐ 3: Chin HS, Sim TS.

Related Articles, Links

C-terminus modification of Streptomyces clavuligerus deacetoxycephalosporin C synthase improves catalysis with an expanded substrate specificity. Biochem Biophys Res Commun. 2002 Jul 5;295(1):55-61. PMID: 12083766 [PubMed - indexed for MEDLINE]

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Mutation of N304 to leucine in Streptomyces clavuligerus deacetoxycephalosporin C synthase creates an enzyme with increased penicillin analogue conversion. Biochem Biophys Res Commun. 2001 Sep 21;287(2):507-13. PMID: 11554757 [PubMed - indexed for MEDLINE]

☒ 5: Lee HJ, Lloyd MD, Harlos K, Clifton IJ, Baldwin JE, Schofield CJ.

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Mutational evidence supporting the involvement of tripartite residues His183, Asp185, and His243 in *Streptomyces clavuligerus* deacetoxycephalosporin C synthase for catalysis.

Biosci Biotechnol Biochem. 2000 Apr;64(4):828-32.

PMID: 10830499 [PubMed - indexed for MEDLINE]

☒ 7: [Lee HJ, Lloyd MD, Harlos K, Schofield CJ.](#)

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The effect of cysteine mutations on recombinant deacetoxycephalosporin C synthase from *S. clavuligerus*.

Biochem Biophys Res Commun. 2000 Jan 7;267(1):445-8.

PMID: 10623639 [PubMed - indexed for MEDLINE]

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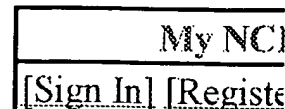
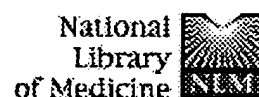
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Conformational flexibility of the C terminus with implications for substrate binding and catalysis revealed in a new crystal form of deacetoxycephalosporin C synthase.

J Mol Biol. 2004 Oct 8;343(1):157-71.

PMID: 15381427 [PubMed - indexed for MEDLINE]

☐ 2: [Lloyd MD, Lipscomb SJ, Hewitson KS, Hensgens CM, Baldwin JE, Schofield CJ.](#) [Related Articles, Links](#)

Controlling the substrate selectivity of deacetoxycephalosporin/deacetylcephalosporin C synthase.

J Biol Chem. 2004 Apr 9;279(15):15420-6. Epub 2004 Jan 20.

PMID: 14734549 [PubMed - indexed for MEDLINE]

☐ 3: [Lee HJ, Dai YF, Shiau CY, Schofield CJ, Lloyd MD.](#) [Related Articles, Links](#)

The kinetic properties of various R258 mutants of deacetoxycephalosporin C synthase.

Eur J Biochem. 2003 Mar;270(6):1301-7.

PMID: 12631288 [PubMed - indexed for MEDLINE]







☐ 4: [Chin HS, Sim TS.](#) [Related Articles, Links](#)

C-terminus modification of Streptomyces clavuligerus deacetoxycephalosporin C synthase improves catalysis with an expanded substrate specificity.

Biochem Biophys Res Commun. 2002 Jul 5;295(1):55-61.

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☐ 5: [Lipscomb SJ, Lee HJ, Mukherji M, Baldwin JE, Schofield CJ, Lloyd MD.](#) [Related Articles, Links](#)

-  The role of arginine residues in substrate binding and catalysis by deacetoxycephalosporin C synthase.  
Eur J Biochem. 2002 Jun;269(11):2735-9.  
PMID: 12047382 [PubMed - indexed for MEDLINE]
- 6: [Terwisscha van Scheltinga AC](#), [Valegard K](#), [Ramaswamy S](#), [Hajdu J](#), [Andersson I](#). Related Articles, Links
-  Multiple isomorphous replacement on merohedral twins: structure determination of deacetoxycephalosporin C synthase.  
Acta Crystallogr D Biol Crystallogr. 2001 Dec;57(Pt 12):1776-85.  
Epub 2001 Nov 21.  
PMID: 11717489 [PubMed - indexed for MEDLINE]
- 7: [Lee HJ](#), [Lloyd MD](#), [Harlos K](#), [Clifton IJ](#), [Baldwin JE](#), [Schofield CJ](#). Related Articles, Links
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J Mol Biol. 2001 May 18;308(5):937-48.  
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-  Alteration of the co-substrate selectivity of deacetoxycephalosporin C synthase. The role of arginine 258.  
J Biol Chem. 2001 May 25;276(21):18290-5. Epub 2001 Feb 21.  
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- 9: [Sim J](#), [Sim TS](#). Related Articles, Links
-  Mutational evidence supporting the involvement of tripartite residues His183, Asp185, and His243 in Streptomyces clavuligerus deacetoxycephalosporin C synthase for catalysis.  
Biosci Biotechnol Biochem. 2000 Apr;64(4):828-32.  
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-  Studies on the active site of deacetoxycephalosporin C synthase.  
J Mol Biol. 1999 Apr 16;287(5):943-60.  
PMID: 10222202 [PubMed - indexed for MEDLINE]



- ☐ **11:** [Valegard K, van Scheltinga AC, Lloyd MD, Hara T, Ramaswamy S, Perrakis A, Thompson A, Lee HJ, Baldwin JE, Schofield CJ, Hajdu J, Andersson I.](#) Related Articles, Links



Structure of a cephalosporin synthase.

Nature. 1998 Aug 20;394(6695):805-9.

PMID: 9723623 [PubMed - indexed for MEDLINE]

- ☐ **12:** [Alvi KA, Reeves CD, Peterson J, Lein J.](#) Related Articles, Links



Isolation and identification of a new cephem compound from *Penicillium chrysogenum* strains expressing deacetoxycephalosporin C synthase activity.

J Antibiot (Tokyo). 1995 Apr;48(4):338-40. No abstract available.

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